

WHAT IS CLAIMED IS:

1. A fixation device for treatment of an orthopedic indication comprising:

a first portion and a second portion;

5 a first clamp assembly for releasably attaching the first portion with at least one bone pin;

a second clamp assembly for releasably attaching the second portion with at least one bone pin;

10 a coupling assembly joining the first portion with the second portion;

the coupling assembly operable to allow rotation of the first portion and the second portion relative to each other in generally vertical and horizontal planes; and

15 respective controls for incremental rotation in the horizontal plane independent of rotation in the vertical plane and incremental rotation in the vertical plane independent of rotation in the horizontal plane.

2. The device of Claim 1 wherein the articulated  
20 coupling assembly further comprises two worm gear assemblies.

3. The device of Claim 1 further comprising an external fixator.

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4. The device of Claim 1 further comprising the first portion having a length less than the length of the second portion.

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5. The device of Claim 1 further comprising the first portion and the second portion having respective elongated configurations defined in part by respective generally rectangular cross sections.

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6. The device of Claim 1 further comprising the first portion and the second portion having substantially the same length.

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7. The device of Claim 1 further comprising:  
a first control for incremental positioning of the first clamp assembly relative to the coupling assembly independent of the position of the second clamp assembly; and

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a second control for incremental positioning of the second clamp assembly relative to the coupling assembly independent of the first clamp assembly.

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8. The device of Claim 1 wherein the coupling assembly further comprises:

a first worm gear assembly having a first worm gear mounted on one end of the first portion;

a second worm gear assembly having a second worm gear mounted on an adjacent end of the second

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portion; and

the first worm gear assembly and the second worm gear assembly engaged with each other.

9. The device of Claim 8 further comprising:  
a first worm shaft operable to incrementally  
position the first worm gear; and  
a second worm shaft operable to incrementally  
5 position the second worm gear.

10. The device of Claim 8 further comprising:  
a first clamp screw operable to lock the first  
worm gear in a desired position relative to the first  
10 portion; and  
a second clamp screw operable to lock the  
second worm gear in a desired position relative to the  
second portion.

11. A method for treatment of an orthopedic indication comprising:

releasably attaching a first portion of a fixation device with at least a first bone pin;

5        releasably attaching a second portion of the fixation device with at least a second bone pin spaced from the first bone pin;

incrementally adjusting articulation of the first portion relative to the second portion and independent of  
10    the second portion; and

incrementally adjusting articulation of the second portion relative to the first portion and independent of the first portion.

15        12. The method of Claim 11 wherein adjusting articulation between the first portion and the second portion of the fixation device further comprises adjusting a first worm gear and a second worm gear.

20        13. The method of Claim 11 further comprising:  
releasably attaching the first portion with the at least first bone pin by a first clamp assembly;

releasably attaching the second portion with the at least second bone pin by a second clamp assembly;

25        incrementally adjusting the position of the first clamp assembly relative to the second clamp assembly; and

incrementally adjusting the position of the second clamp assembly relative to the first clamp  
30    assembly.

14. The method of Claim 11 further comprising:  
incrementally adjusting articulation of the  
first portion relative to the second portion by rotation  
of a first worm gear; and

5 incrementally adjusting articulation of the  
second portion relative to the first portion by adjusting  
the position of a second worm gear.

15. The method of Claim 11 further comprising:  
10 securing the first portion in an articulated  
position relative to the second portion by clamping a  
first gear in a desired position; and  
securing the second portion in a desired  
articulated position relative to the first portion by  
15 clamping a second worm gear in a desired position.

16. An external fixation device comprising:  
a first portion and a second portion coupled with  
each other by a first worm gear assembly and a second  
worm gear assembly;

5 the first worm gear assembly operable to  
incrementally adjust rotation of the first portion  
relative to the second portion in a generally horizontal  
plane; and

the second worm gear assembly operable to  
10 incrementally adjust rotation of the second portion  
relative to the first portion in a generally vertical  
plane.

17. The external fixation device of Claim 16  
15 further comprising:

the first worm gear assembly having a first  
worm shaft and a first worm gear;

the second worm gear assembly having a second  
worm shaft and a second worm gear; and

20 the first worm gear, securely attached with the  
second worm gear.

18. The external fixation device of Claim 16  
further comprising:

25 a first clamp assembly for releasably attaching  
the first portion with a pair of bone pins; and

a second clamp assembly for releasably  
attaching the second portion with at least a pair of bone  
pins.

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19. The external fixation device of Claim 16  
further comprising:

a first control operable to adjust the rotation  
of the first portion relative to the second portion

5 independent of the second gear assembly; and

a second control operable to adjust rotation of  
the second portion independent of the first worm gear  
assembly.